Selected Abstracts from the June Issue of the European Journal of Vascular and Endovascular Surgery

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Low Molecular Weight Heparin Significantly Reduces Embolisation After Carotid Endarterectomy – A Randomised Controlled Trial

McMahon G.S., Webster S.E., Hayes P.D., Jones C.I., Goodall A.H., Naylor A.R. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objectives: The administration of unfractionated heparin (UFH) prior to carotid clamping during carotid endarterectomy (CEA) transiently increases the platelet aggregation response to arachidonic acid (AA) despite the use of aspirin. We hypothesized that this phenomenon might be reduced by using low molecular weight heparin (LMWH) resulting in fewer emboli in the early post-operative period.

Methods: 183 aspirinated patients undergoing CEA were randomised to 5000 IU UFH ($n = 91$) or 2500 IU LMWH (dalteparin, $n = 92$) prior to carotid clamping. End-points were: transcranial Doppler (TCD) measurement of embolisation, effect on bleeding and platelet aggregation to AA and adenosine 5′-diphosphate (ADP).

Results: Patients randomised to UFH had twice the odds of experiencing a higher number of emboli in the first 3 h after CEA, than those randomised to LMWH ($p = 0.04$). This was not associated with increased bleeding (mean time from flow restoration to operation end: 23 min (UFH) vs. 24 min (LMWH), $p = 0.18$). Platelet aggregation to AA increased significantly following heparinisation, but was unaffected by heparin type ($p = 0.90$). The platelets of patients randomised to LMWH exhibited significantly lower aggregation to ADP compared to UFH ($p < 0.0001$).

Conclusions: Intravenous LMWH is associated with a significant reduction in post-operative embolisation without increased bleeding. The higher rate of embolisation seen with UFH may be mediated by increased platelet aggregation to ADP, rather than to AA.

Thoracoabdominal Aortic Aneurysm Repair: Results of Conventional Open Surgery

Schepens M.A., Heijmen R.H., Ranschaert W., Sonker U., Morshuis W.J. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objectives: The aim of this study is to report our experience in the surgical repair of thoracoabdominal aortic aneurysms (TAAAs) over the last 27 years against the background of evolving surgical techniques.

Methods: We reviewed the prospectively collected data of 571 patients who underwent open TAAA repair between 1981 and 2008. Data were analysed using univariate and multivariate analysis (logistic regression). Pre-, intra- and postoperative risk factors were used to develop risk models for in-hospital mortality, spinal cord deficit and renal failure. Recent published series were used to highlight the different treatment modalities and explore results.

Results: Seventy patients (12.3%) died in the hospital, the 30-day mortality was 8.9%, 37 patients (6.5%) required postoperative dialysis and 47 patients (8.3%) developed paraplegia or paraparesis. The incidence of paraplegia in the left heart bypass group was 4.4%. The predictors for hospital mortality were increasing age (odds ratio 1.096 per year, 95% confidence interval (CI): 1.05–1.14) and the need for haemodialysis (odds ratio 10, 95% CI: 4.7–21.1). For postoperative spinal cord deficit, we found three protecting factors: age above 75 years (odds ratio 0.14, 95% CI: 0.19–1.09), the presence of a post-dissection aneurysm (odds ratio 0.4, 95% CI: 0.17–0.94) and the combined use of cerebrospinal fluid drainage and motor-evoked potentials (odds ratio 0.28, 95% CI: 0.14–0.56). The urgency of procedure (odds ratio 4, 95% CI: 1.8–9) and preoperative serum creatinine level (odds ratio 1.007 per micromole per litre, 95% CI: 1.0–1.01) were significant risk factors for renal failure.

Conclusions: Open TAAA repair intrinsically has substantial complications, of which spinal cord ischaemia and renal failure are the most devastating, despite major progress in our understanding of the pathophysiology and operative strategy. An overview of the results of recently published series is given along with an analysis of our data.

Atherosclerosis and Disc Degeneration/Low-Back Pain – A Systematic Review

Kauppila L.I. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objectives: Atherosclerosis can obstruct branching arteries of the abdominal aorta, including four paired lumbar arteries and the middle sacral artery that feed the lumbar spine. The diminished blood flow could result in various back problems. The aim of this systematic literature review was to assess associations between atherosclerosis and disc degeneration (DD) or low-back pain (LBP).

Data sources: A systematic search of the Medline/PubMed database for all original articles on atherosclerosis and DD/LBP published until October 2008. The search was performed with the medical subject headings atherosclerosis, cardiovascular risk factor, or vascular disease and keywords "disc degeneration", "disc herniation", and "back pain" on the basis of MeSH tree and as a text search. In addition reference lists were studied and searched manually. Observational studies investigating the association of atherosclerosis or its risk factors and lumbar DD/LBP were selected.

Review methods: The following data were extracted: study characteristics, duration of follow-up, year of publication, findings of atherosclerosis/cardiovascular risk factors and DD/LBP. Disc herniation was regarded as a form of disc degeneration and cardiovascular risk factors were regarded as surrogate for atherosclerosis in epidemiological studies.

Results: One hundred and seventy-nine papers were identified. After exclusion of case reports, letters, editorials, papers not related to the lumbar spine, and animal studies, 25 papers were included. Post-mortem studies showed an association between atheromatous lesions in the aorta and DD, as well as between occluded lumbar arteries and life-time LBP. In clinical studies, aortic calcification was associated with LBP, and stenosis of lumbar arteries was associated with both DD and LBP. In epidemiological studies, smoking and high serum cholesterol levels were found to have the most consistent associations with DD and LBP.

Conclusion: Aortic atherosclerosis and stenosis of the feeding arteries of the lumbar spine were associated with DD and LBP. Cardiovascular risk factors had weaker associations, being clearly apparent only in cohorts on elderly people or in large study samples. More prospective clinical studies are needed to further clarify the association of atherosclerosis and low-back disorders.

A Study of Pullout Forces of the Components of Modular Multi-manufacturer Hybrid Endografts Used for Aortic Aneurysm Repair

Cinà D.P., Grant G., Peterson M., Campbell V., Garrido-Olivares L., Cinà C.S. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objectives: Aorto-iliac angulations may be challenging for modular stent-graft systems (SGSs) from a single manufacturer. This study aims to define the pullout forces (POFs) of SGSs derived from the same (non-hybrid) or different manufacturers (hybrid).

Methods: The POFs were tested in a vertical position in air and 5% albumin. We studied the POFs between legs from Anaconda (Vascutek®), Excluder (Gore®), Talent (Medtronic®) and Zenith (Cook®) with the contralateral limb of bifurcated aortic bodies from Zenith (12 mm), Anaconda and Excluder.

Results: For non-hybrid SGSs, the POFs decreased in the following order: Anaconda (11.2 ± 0.6 N), Talent (6.25 ± 0.6 N), Zenith (3.5 ± 0.01 N) and Excluder (2.5 ± 0.5 N). The Zenith body with the Anaconda limb (15 mm) registered the greatest POF (13.083 ± 0.821 N); the Zenith and Excluder bodies combined with the Excluder limb (16 mm) registered the weakest POFs (2.397 ± 0.22 N and 2.500 ± 0.479 N, respectively). The Zenith body combined with the Excluder limb (16 mm) had a POF similar to the Zenith non-hybrid; combined with Talent 14 mm and Anaconda limb exhibited POFs greater than the Zenith non-hybrid system. For the limb-to-limb POFs, the greatest was registered for the Anaconda limb, 13 mm within a 12-mm extension for 40-mm overlaps (23.06 ± 0.480 N); the weakest POFs were recorded for the Excluder limbs at 30-mm overlaps (1.09 ± 0.167 N and 1.11 ± 0.250 N).

Conclusions: The hybrid SGSs performed as well as or better than the non-hybrid systems, and should be considered for clinical testing in patients whose unique anatomy warrants the flexibility that the use of hybrids provides.